MITSUBISHI ELECTRIC
Changes for the Better

INVERTER

New Product RELEASE No.23-1E

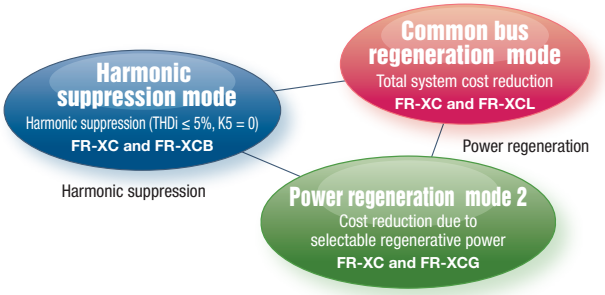
A New Lineup of FR-XC Series Multifunction Regeneration Converters

Addition of a new stand-alone option for our general-purpose inverters—400 V class 160K/220K FR-XC series converters which have a harmonic suppression function and power regeneration capability.

Features

Multifunction power regeneration converter

Choose the suitable function for your needs by using the FR-XC converter with the FR-XCB, FR-XCL, or FR-XCG reactor.



Compact design offers solution to harmonic problems

When the FR-XC series converter is used with the dedicated box-type reactor FR-XCB, the total harmonic distortion of the input current (THDi) is 5% or less, which facilitates compliance with the overseas standards related to harmonic suppression.


FR-XC-H160K


FR-XCB-H160K


FR-MCB-H400


FR-XCL-H160K

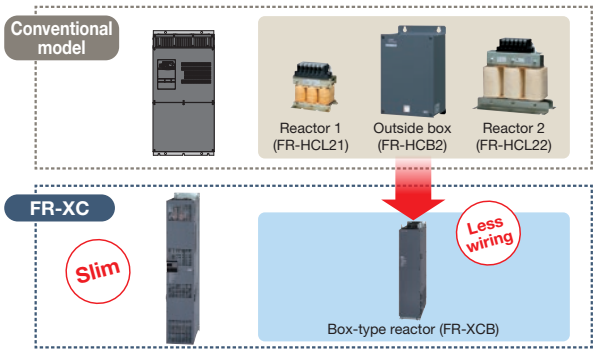

FR-XCG-H160K

Merits

Wire and space saving

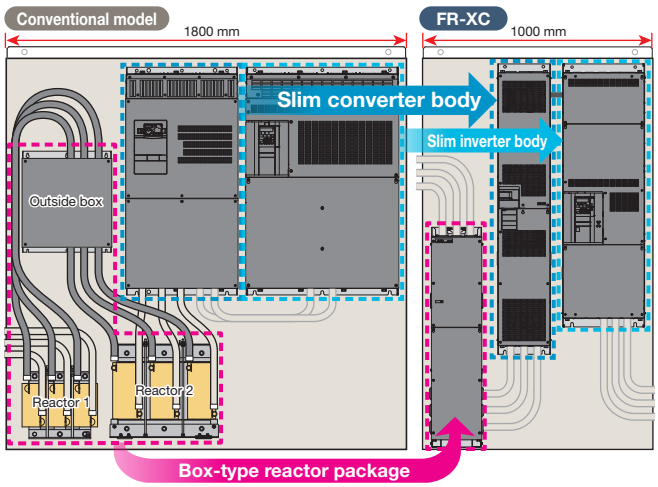
The slim converter requires less space, and the FR-XCB box-type reactor[*1] enables wiring reduction as it contains peripheral devices such as reactors.

*1: Used for the FR-XC converter in harmonic suppression mode.



Installation space reduced by 40% or more

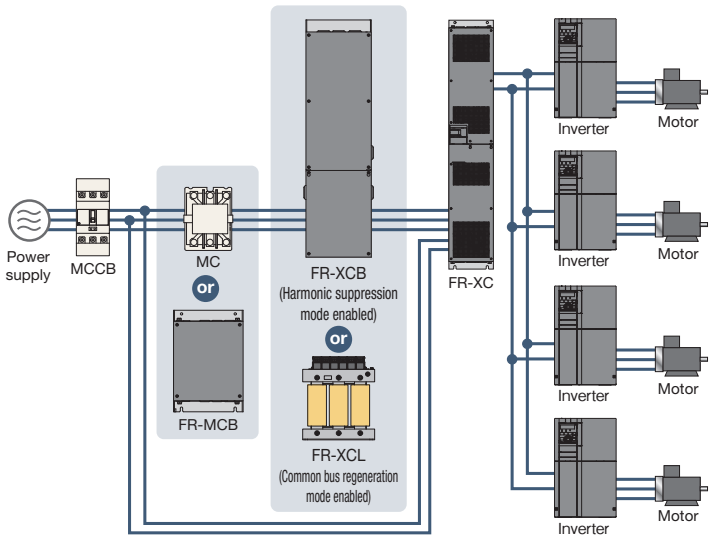
Width is reduced from 1800 mm to 1000 mm.



Release schedule February 2023

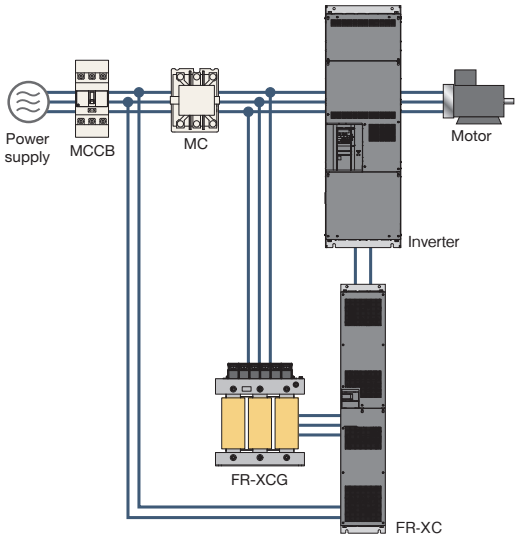
System configuration

Common bus regeneration mode/Harmonic suppression mode



- The dedicated contactor box FR-MCB is installed for coordination with the charging circuit.
- Up to 10 inverters can be connected.

Power regeneration mode 2



- The FR-XCG reactor is used only with the FR-XC in power regeneration mode 2.

Rated specifications

Model FR-XC-H[ ]K(-PWM)*1				160	220
Common bus regeneration mode	50°C rating	Applicable inverter capacity (kW)		160	220
		Applicable motor current (A)		325	432
		Rated input current (A)	Power driving	331	450
			Regenerative driving	288	396
		Overload current rating		100% continuous / 150% 60 s	
		Power supply capacity (kVA)*2		279	379
	40°C rating	Applicable inverter capacity (kW)		185	250
		Applicable motor current (A)		361	481
		Rated input current (A)	Power driving	382	515
			Regenerative driving	333	450
		Overload current rating		100% continuous / 150% 60 s	
		Power supply capacity (kVA)*2		322	434
	Power source	Rated input AC voltage/frequency		Three-phase 380 to 500 V, 50/60 Hz*3*4	
		Permissible AC voltage fluctuation		Three-phase 323 to 550 V, 50/60 Hz	
		Permissible frequency fluctuation		±5%	
Harmonic suppression mode	50°C rating	Applicable inverter capacity (kW)		160	220
		Applicable motor current (A)		325	432
		Rated input current (A)	Power/regenerative driving	290	397
		Overload current rating		100% continuous / 150% 60 s	
		Power supply capacity (kVA)*2		245	334
	40°C rating	Applicable inverter capacity (kW)		185	250
		Applicable motor current (A)		361	481
		Rated input current (A)	Power/regenerative driving	335	450
		Overload current rating		100% continuous / 150% 60 s	
		Power supply capacity (kVA)*2		282	379
	Power source	Rated input AC voltage/frequency		Three-phase 380 to 480 V, 50/60 Hz*5	
		Permissible AC voltage fluctuation		Three-phase 323 to 506 V, 50/60 Hz	
		Permissible frequency fluctuation		±5%	
	Input power factor			0.99 or more (when load ratio is 100%)	
Power regeneration mode 2	50°C rating	Potential regenerative capacity (kW)*6		132	185
		Rated current (A)	Regenerative driving	238	333
		Overload current rating		100% continuous / 150% 60 s	
	40°C rating	Potential regenerative capacity (kW)*6		160	220
		Rated current (A)	Regenerative driving	288	396
		Overload current rating		100% continuous / 150% 60 s	
Protection rating of structure (IEC 60529)				IP20*7(also for FR-XCB and FR-MCB)	
Cooling system				Forced air	
Number of connectable inverters				10*8*9	
Approx. mass (kg)*10				96	

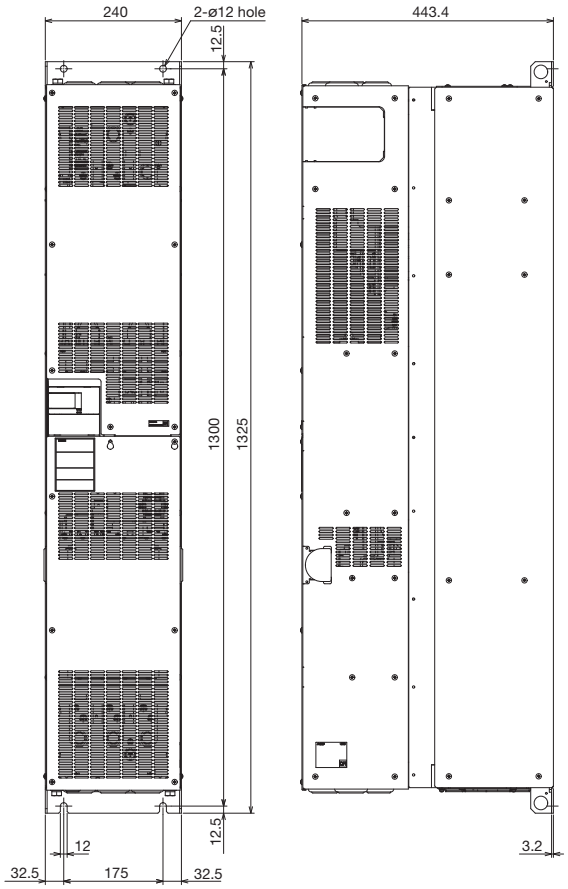
*1: The factory defaults of the control method differ by model (FR-XC-[ ]K: common bus regeneration mode, FR-XC-[ ]K-PWM: harmonic suppression mode).
*2: Selection example for 440 V power supply voltage.
*3: The rated voltage of the FR-MCB is three-phase 380 to 480 V, 50/60 Hz.
*4: The permissible voltage imbalance ratio is 3% or less. (Unbalance factor = Max | Line voltage - Mean of three line voltages | / Mean of three line voltages × 100)
*5: The DC bus voltage is approx. 594 VDC at an input voltage of 400 VAC, approx. 653 VDC at 440 VAC, and approx. 713 VDC at 480 VAC.
*6: Maximum capacity of regenerative power generated from the Mitsubishi Electric 4-pole standard motor in each axis.
*7: IP00 when the side wiring cover of the FR-XC is removed.
*8: If you want to connect 11 or more inverters, contact your sales representative.
*9: One inverter for operation in the power regeneration mode 2.
*10: Mass of the FR-XC alone.

Outline dimensions

Unit: mm

Multifunction regeneration converter FR-XC

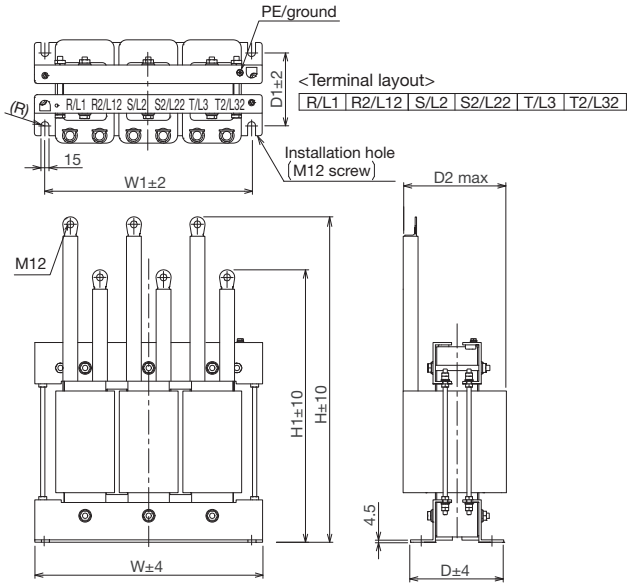
• FR-XC-H160K, H220(-PWM)



Dedicated stand-alone reactor FR-XCL/FR-XCG

• FR-XCL-H160K, H185K, H220K, H250K

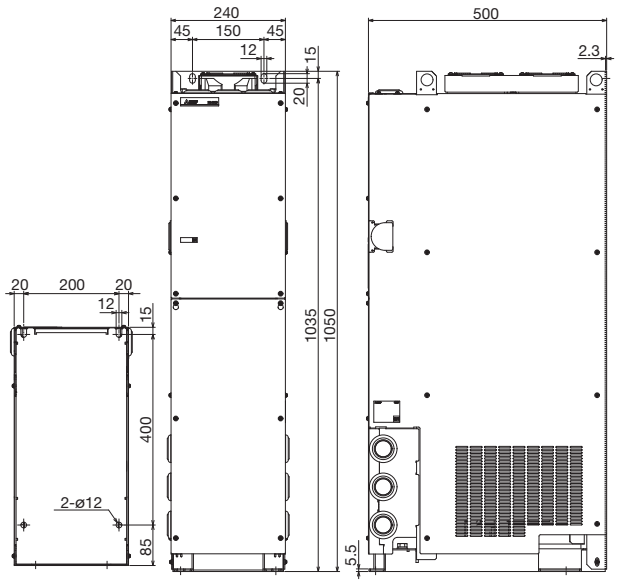
• FR-XCG-H132K, H160K, H185K, H220K



Model	W	W1	D	D1	D2	H	H1	Terminal screw size	Mass
FR-XCL-H160K	430	390	176	140	190	600	500	M12	95 kg
FR-XCL-H185K			196	160	210				115 kg
FR-XCL-H220K	500	460				640	540		150 kg
FR-XCL-H250K						660	560		160 kg
FR-XCG-H132K	430	390	176	140	195	560	460	M12	80 kg
FR-XCG-H160K					190	600	500		95 kg
FR-XCG-H185K			196	160	210				115 kg
FR-XCG-H220K	500	460				650	550		150 kg

Dedicated box-type reactor FR-XCB

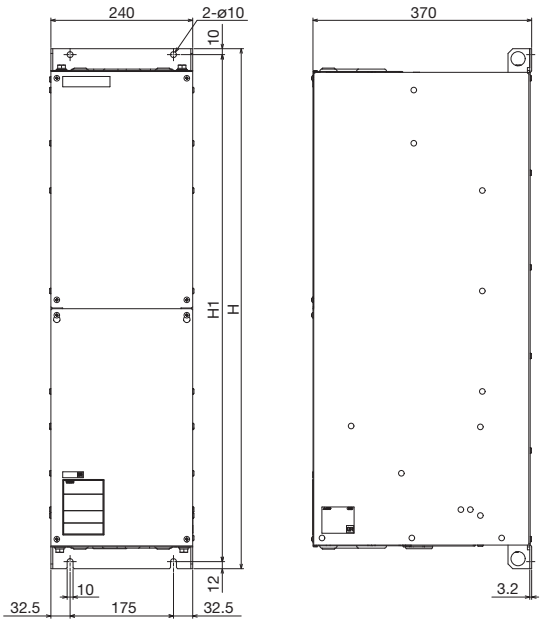
• FR-XCB-H160K, H220K



Model	Mass
FR-XCB-H160K	230 kg
FR-XCB-H220K	260 kg

Dedicated contactor box FR-MCB

• FR-MCB-H400, H800



Model	H	H1	Mass
FR-MCB-H400	540	518	29 kg
FR-MCB-H800	880	858	51 kg

Lineup

Multifunction regeneration converter model

Multifunction regeneration converter with harmonic suppression and power regeneration functions.

●: Newly released model
●: Released
○: To be released
—: Not applicable

Specifications of the models to be released are subject to change without prior notice.

FR-XC-H160K-□□

Symbol	Voltage
None	200 V class
H	400 V class

Converter capacity
Capacity (kW)

Symbol	Circuit board coating	Plated conductor
None	Without	Without
60	With	Without
06	With	With

Symbol	Functional specification*1
None	Common bus regeneration mode
PWM	Harmonic suppression mode

*1 Pr.416 ="9999"

Voltage	Model	7.5	11	15	18.5	22	30	37	55	75	110	160	220
200 V	FR-XC-[ ]K	●	●	●	—	●	●	●	●	—	—	—	—
	FR-XC-[ ]K-PWM	—	—	—	●	●	—	●	●	—	—	—	—
400 V	FR-XC-H[ ]K	●	●	●	—	●	●	●	●	●	○	●	●
	FR-XC-H[ ]K-PWM	—	—	—	●	●	—	●	●	●	○	●	●

Dedicated stand-alone reactor (option) model

A stand-alone reactor for use with the FR-XC converter in common bus regeneration mode.

FR-XCL-H160K

Symbol	Voltage
None	200 V class
H	400 V class

Reactor capacity
Capacity (kW)

A stand-alone reactor for use with the FR-XC converter in power regeneration mode 2.

FR-XCG-H132K

Symbol	Voltage
None	200 V class
H	400 V class

Reactor capacity
Capacity (kW)

Voltage	Model	7.5	11	15	22	30	37	55	75	90	132	160	185	220	250
200 V	FR-XCL-[ ]K	●	●	●	●	●	●	●	—	—	—	—	—	—	—
	FR-XCG-[ ]K	●	●	●	●	●	●	●	—	—	—	—	—	—	—
400 V	FR-XCL-H[ ]K	●	●	●	●	●	●	●	●	●	—	●	●	●	●
	FR-XCG-H[ ]K	●	●	●	●	●	●	●	●	●	●	●	●	●	—

Dedicated box-type reactor (option) model

A stand-alone box-type reactor for use with the FR-XC converter in harmonic suppression mode.

FR-XCB-H160K-□

Symbol	Voltage
None	200 V class
H	400 V class

Reactor capacity
Capacity (kW)

Symbol	Circuit board coating
None	Without
60	With

Voltage	Model	18.5	22	37	55	75	110	160	220
200 V	FR-XCB-[ ]K	●	●	●	●	—	—	—	—
400 V	FR-XCB-H[ ]K	●	●	●	●	●	○	●	●

Dedicated contactor box (option) model

A dedicated contactor box used for coordination with the charging circuit.

FR-MCB-H400

Symbol	Voltage
H	400 V class

Capacity	Built-in magnetic contactor
150	S-N[ ] AC200 V
400	
800	

Combination with FR-XC-H[ ]K

Operation mode	Model	Rated surrounding temperature	Capacity
Common bus regeneration mode	FR-XC-H75K FR-XC-H75K-PWM	50°C rating	FR-MCB-H150
		40°C rating	
	FR-XC-H160K FR-XC-H160K-PWM	50°C rating	FR-MCB-H400
		40°C rating	
	FR-XC-H220K FR-XC-H220K-PWM	50°C rating	FR-MCB-H400
		40°C rating	FR-MCB-H800
Harmonic suppression mode	FR-XC-H75K FR-XC-H75K-PWM	50°C rating	FR-MCB-H150
		40°C rating	
	FR-XC-H160K FR-XC-H160K-PWM	50°C rating	FR-MCB-H400
		40°C rating	
	FR-XC-H220K FR-XC-H220K-PWM	50°C rating	FR-MCB-H400
		40°C rating	

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

2302(MEE)